TYLER CREEK TIMBER SALE

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

MISSOULA UNIT

OCTOBER 2005

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TYLER CREEK TIMBER SALE
SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

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FINDING
TYLER CREEK TIMBER SALE

1. ALTERNATIVE SELECTED

Three alternatives were presented and the effects of each alternative were fully analyzed in the EA:

1. Alternative A: No Harvest
2. Alternative B: Harvest including some designated > 20" DBH trees
3. Alternative C: Harvest with no > 20" DBH trees removed

The original Decision Maker for this project selected Alternative B for implementation.

Due to an infestation of Douglas-fir beetle, which has caused a significant amount of mortality within the project area, another alternative (Alternative D) was developed and analyzed in a Supplemental EA.

The Alternative D: Harvest including beetle killed trees > 21" DBH which retain commercial value proposes to harvest approximately 2.5 million board feet (MMBF) from 386 acres. The three previous alternatives did not address the recent epidemic of Douglas Fir Beetle.

For the following reasons, I have selected Alternative D:

a) Alternative D: Harvest including beetle killed trees > 21"DBH which retain commercial value. This alternative meets the Purpose of Action and Project Objectives as described on pages 1 and 2 of the Supplemental EA. Implementation of this alternative would produce an estimated $750,000 ($300.00/MBF) to the Common School (CS) grant.

b) The analysis of identified issues did not disclose any reason compelling the DNRC not to implement the timber sale.

c) Alternative D: Harvest including beetle killed trees > 21"DBH includes mitigation activities to address environmental concerns identified during both the Public Scoping phase and the project analysis.

2. SIGNIFICANCE OF IMPACTS

For the following reasons, I find that implementation of Alternative D: Harvest including beetle killed trees > 21" DBH will not have significant impacts on the human environment:

a) **Water Quality-** A DNRC Hydrologist analyzed the effects of the proposed Alternative D and found the anticipated effects of the modified proposed actions are within the range of effects analyzed for under both of the previous Action Alternatives B and C that were contained in the original EA. As a result of this analysis, it was concluded that there is little risk of adverse impacts to water quality, cold-water fisheries and other beneficial uses occurring as a result of Alternative D.

b) **Water Yield-** Results of the updated water yield analysis indicate that the levels of water yield increases anticipated under Alternative D are still below those levels normally associated with detrimental impacts to stream channel stability and function, therefore, no significant impacts will occur.

c) **Cumulative Watershed Effects-** A DNRC Hydrologist analyzed the proposed Alternative D and found the effects of the modified proposed action are within the range analyzed for under both of the previous Action Alternatives B and C that were contained in the original EA. In fact, erosion control measures aimed at stabilization of existing stream crossings and other improvements to the existing road system are expected to result in a long-term improvement to downstream water quality and improved protection of beneficial uses still holds true under the proposed Alternative D.

d) **Cold Water Fisheries-** A DNRC Hydrologist analyzed the effects of the proposed Alternative D and found the effects of the modified proposed action are within the range analyzed for under both of the previous Action Alternatives B and C that were contained in the original EA. As a result of this analysis, it was concluded that there is little risk of adverse impacts to water quality, cold-water fisheries and other beneficial uses occurring as a result of implementing Alternative D. This conclusion applies to the potential risk of direct, indirect and cumulative adverse effects to water resources and beneficial uses of those cold-water resources, including cold-water fisheries.

e) **Noxious Weeds-** Alternative A: No Harvest (No Action) would result in weeds slowly advancing along the edges of existing roads and from adjacent private land creating a net cumulative detriment to weed free resources. Alternative D: Harvest including Beetle Killed trees > 21" DBH would include control efforts which would promote revegetation and emphasize treatment of any new noxious weeds. This would include 2 years of monitoring and controlling spot infestations as needed.

f) **Economics-** Implementation of Alternative D will provide approximately $750,000 in short-term revenue to the Common School Trust and does not limit the DNRC's options for generating revenue from these sites in the future.

g) **Old Growth-** Implementation of Alternative A: No Action, would have negative short and long term effects upon the old growth stands that currently exist within the proposed project area by increasing the threat to the current stands posed by both inter-tree competition and increasing fuel loads. Alternative D: Harvest including Beetle Killed Trees > 21" DBH, would reduce the number of small trees, thereby reducing inter-tree competition and removing ladder fuels which would increase the probability of retaining old growth characteristics along

with inereased vigor in the remaining trees. This aetion would have a long- term positive effeet on this resouree.

h) **Wildlife-** The proposed harvest operations present a minimal likelihood of negative impaets to Threatened and Endangered Speeies. Those potential impaets that do exist have been mitigated to levels within aeeeptable thresholds. The same is true for those speeies that have been identified as "sensitive" by the DNRC. Alternative D presents a low risk of eumulative effeets due to mitigations for wildlife travel and eover. Two loeked gates on the main road aeeessing the area also lessen human disturbanee.

i) **Keeled Mountainsnail** – The proposed harvest operations present a minimal likelihood of negative impaets to the Keeled Mountainsnail population. Alternative D requires Equipment Restriction Zones to be plaeed around areas of known or potential snail habitat loeated within eutting units. The May 18, 2005 field survey found a healthy population of snails outside any eutting units in an area where there would be no harvest aetivity or human disturbanee. The harvest aetivities would aetually deerease the potential for loss of snail populations or habitat by eliminating the threat of eatastrophie wildfire.

3. PRECEDENT SETTING AND CUMULATIVE IMPACTS-

The project area is located on State- owned lands, which are "principally valuable for the timber that is on them or for growing timber or for watershed" (**MCA 77-1-402**). The proposed action is similar to past projects that have

occurred in the area. Since the EA does not identify future actions that are new or unusual, the proposed timber harvest is not setting precedence for a future action with significant impacts.

Taken individually and cumulatively, the identified impacts of the proposed timber sale are within established threshold limits. Proposed timber sale activities are common practices and none of the project activities are being conducted on fragile or unique sites.

The proposed timber sale conforms to the management philosophy adopted by DNRC and is in compliance with existing laws, policies, guidelines, and standards applicable to this type of action.

4. SHOULD DNRC PREPARE AN ENVRONMENTAL IMPACT STATEMENT (EIS)?

Based on the following, I find that an EIS does not need to be prepared:

a) The EA adequately addressed the issues identified during project development, and displayed the information needed to make the pertinent decisions.

b) Evaluation of the potential impacts of the proposed timber sale indicate that significant impacts to the human environment will not occur as a result of the implementation of Alternative D: Harvest including Beetle Killed Trees > 21"DBH.

c) The ID Team provided opportunities for public review and comment during project development and analysis.

Jeffrey L. Rupkalvis
Forest Management Supervisor
Missoula Unit
September 29, 2005

SUMMARY

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED TYLER CREEK TIMBER SALE

INTRODUCTION AND DESCRIPTION OF THE PROPOSED ACTION-

The Department of Natural Resources and Conservation (DNRC), Missoula Unit, proposes to harvest timber in Section 36 T11N R15W to generate revenue for the Montana School Trust. The project is located approximately 13 air miles west of Drummond, Montana **(See Exhibit #1-Vicinity Map)**. In July of 1999, the Decision Maker selected Alternative B that was analyzed in the original Tyler Creek Environmental Assessment (EA) prepared for this proposed action (DNRC, 1999). Alternative B proposed the following actions-

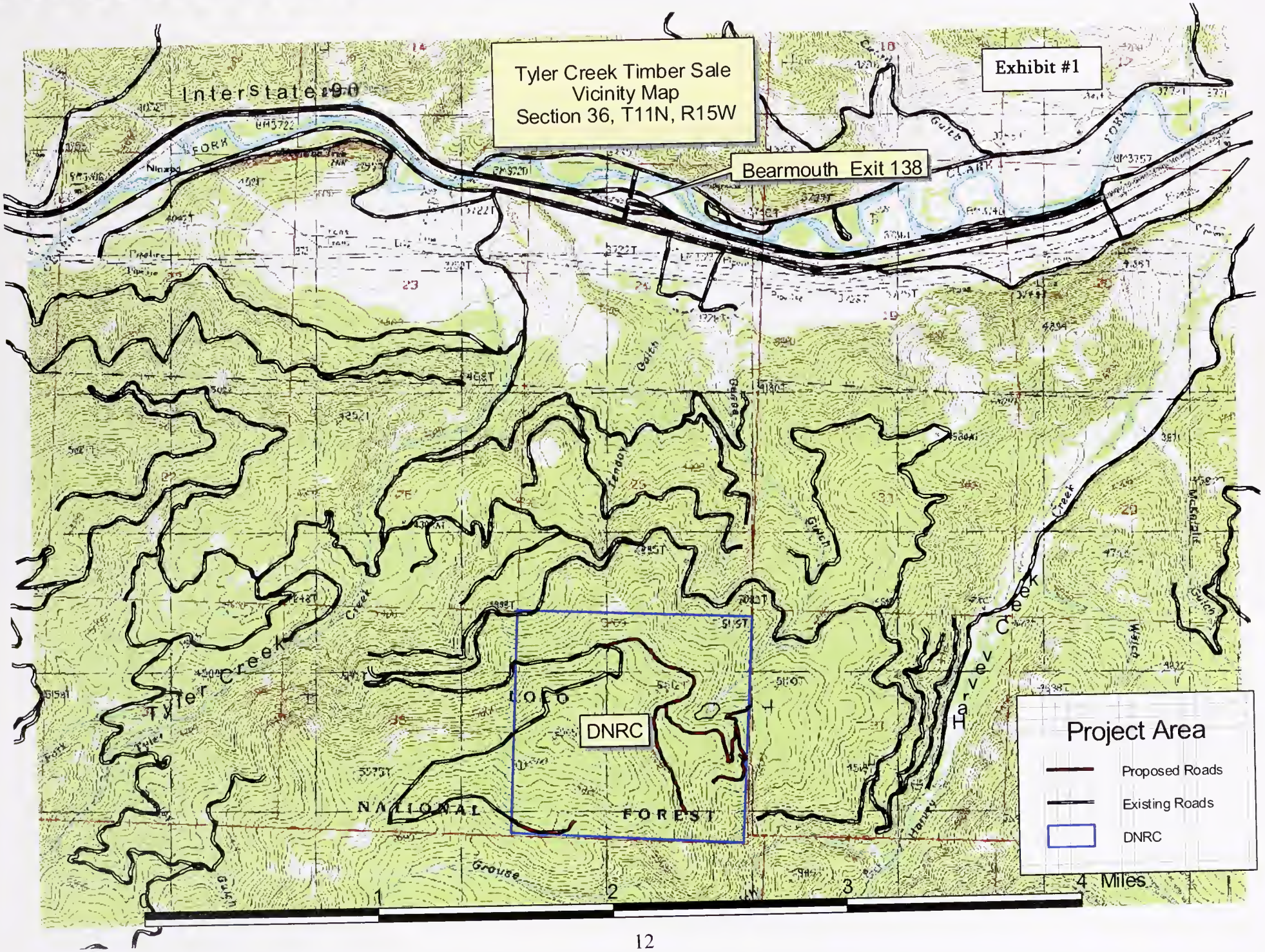
- The harvest of approximately 2.5 million board feet (MMBF) from 386 acres.
- 52 acres of Old Growth forest would be harvested using a shelterwood treatment.
- 249 acres of Old Growth would be left untreated to provide for overstory cover and a large movement corridor from southwest to northeast across the section.
- Approximately 2.5 miles of new road would be constructed.

In 2000, the DNRC was sued over the Old Growth guidance that was in place during the development of several timber sales including Tyler Creek. Until the adjudication of this lawsuit was completed, the DNRC was enjoined from conducting any harvesting activities in areas that contained Old Growth. This injunction applied to the Tyler Creek Timber Sale. This lawsuit resulted in DNRC being required to develop and adopt the Administrative Rules for Forest Management (Administrative Rules of Montana [*ARM] 36.11.401 through 450*). Upon adoption of these rules, the DNRC moved forward with implementing the Tyler Creek Timber Sale.

PROJECT NEED-

The lands involved in this proposed project are held by the State of Montana in trust for the support of specific beneficiary institutions such as public schools, state colleges and universities, and other specific state institutions such as the School for the Deaf and Blind (Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X, Section 11). The Montana State Board of Land Commissioners and the DNRC are required by law to administer these trust lands to produce the largest measure of reasonable and legitimate return over the long run for these beneficiary institutions (Section 77-1-202, MCA). On March 12, 2003, DNRC adopted Administrative Rules for Forest Management (Administrative Rules of Montana [*ARM]*

36.11.401 through 450). These lands are managed under the programmatic guidance of DNRC'.


Tyler Creek Timber Sale
Vicinity Map
Section 36, T11N, R15W
Exhibit #1
Interstate 90
Bearmouth Exit 138
DNRC
NATIONAL FOREST
Project Area
Proposed Roads
Existing Roads
DNRC
0
1
2
3
4 Miles

Additionally, the stands on these parcels of land are generally in poor to fair health due to infestations of Douglas-fir Beetle (*Dendroctonus pseudotsugae)* and Mountain Pine Beetle *(Dendroctonus ponderosae)* and are in need of treatment to restore their potential to generate income for the trust beneficiaries.

PROJECT OBJECTIVES-

The Tyler Creek Timber Sale must produce the largest measure of reasonable and legitimate return to the School Trust in the long run. The sale would also provide a sufficient amount of sawlog volume to contribute to the sustained yield for DNRC managed lands as mandated by State Statute 77-5-222, *MCA.*

The proposed project would move the forest toward the desired future conditions characterized by the proportion and distribution of forest types and structures historically present on the landscape.

The primary objectives of the Tyler Creek Timber Sale, as presented in the EA are

1. Harvest between 1.5 and 3.0 million board feet (MMBF) of sawtimber to generate a net positive rate of return for the Common School (CS) grant.

2. To manage the forest for appropriate or desired future conditions, characterized by the proportion and distribution of forest types and structures typical of those represented under average historic conditions.

PROJECT AREA-

The Tyler Creek proposed timber harvest area is located approximately 13 air miles west of Drummond, Montana and 30 air miles east of Missoula, Montana. The proposed sale is located in the Tyler and Harvey Creek watersheds of the Clark Fork River. The project is located on 640 acres of state trust land. Most of the forested stands in the proposal area are at least 150 years old (140 years for lodgepole pine), at least 4 thousand board feet (4 MBF) net per acre, and have structural attributes commonly associated with old age. Stands within the section are composed of Douglas fir, ponderosa pine, and western larch/Douglas-fir cover types. Only 3 stands in the section (total of 55 acres) are younger than 150 years, and these are classed as 100-149 years. Unlike neighboring areas, this section has not been logged in the past. Therefore, natural successional processes have been allowed to proceed without the removal of large-sized trees or other habitat components. However, the area has experienced fire suppression in the past 50-80 years, so that the understory is denser now than would have been expected with historic fire regimes. The largest, oldest Douglas-fir trees show fire scars, indicating that non-lethal burns have occurred in the area. Several trees were bored and found to be over 200 years old. Two stands (a total of 50 acres) are densely stocked pole-sized lodgepole pine, indicating that hotter burns occurred in those areas. The section has 1.3 miles of existing road, built in 1995 to access neighboring Plum Creek Timber Co. land. The section is bordered on the north, east and west sides by lands that were formerly owned by Plum Creek Timber Co. and were recently acquired by Stimson Lumber Co (2004). The south side of the section adjoins National Forest lands. The project area is colored blue on USFS maps.

EA DEVELOPMENT-

The original project EA was prepared in compliance with the Montana Environmental Policy Act (MEPA). MEPA requires state government to include consideration of environmental impacts in it's decision making process. It also requires

agencies to inform the public and other interested parties of the proposed projects, environmental impacts that might result, and alternative actions that could achieve project objectives.

PUBLIC SCOPING-

The initial stage in the preparation of an EA is the public scoping process, which is used to inform the public that a state agency is proposing an action and to gather comments on the possible impacts of the project. The scope of the EA was determined by the professional judgment of resource specialists and other agencies and comments from the public and other interested parties.

Comments from the general public, interest groups and agency specialists were solicited as part of the EA. Legal notices were run in the Missoulian newspaper on July 31, August 7 & 14, 1998. Public notices were posted from early August to September 15 at the post offices and local grocery stores in Drummond and Clinton with additional postings at the Bearmouth Chalet and the locked gate at the bottom of Tyler Creek. Scoping notices were sent to all individuals and organizations on Missoula Unit's list of interested parties and the grazing lessee for the parcel. Two written comments were received. One was from F.H. Stoltze Land & Lumber Co. and one was from the Montana Wood Products Association. Both comments encouraged timber harvest within the project areas and analysis of rate of return and cost effectiveness of work required in any subsequent timber sales.

In addition, the DNRC received comments in December 2004 from the local Montana Department of Fish, Wildlife, and Parks (DFWP) biologist regarding the changes in harvesting strategies due to the Douglas-fir Beetle infestation.

The mailing list of parties interested in the project is located in the project file. Public scoping comments are summarized in the original EA.

CONCERNS RAISED DURING PUBLIC SCOPING-

Through the scoping process, concerns were raised by the public and specialists within DNRC and other agencies about the project's potential impacts on the environment. These concerns were used in developing the alternatives presented in Chapter 2 of the Tyler Creek EA.

DECISION NOTICE-

On July 29, 1999 Tobin M. Kelley, the project's Decision Maker issued a Decision Notice which selected Alternative B for implementation.

SUPPLEMENTAL EA-

In May of 2004, just prior to the completion of the bid process for this timber sale, it became apparent that there had was an ongoing infestation of Douglas-fir Beetle within the proposed sale area **(See Exhibits #2-6)**. As a result of the substantial amount of tree mortality caused by this infestation, it was determined that a different harvesting alternative, i.e. one that dealt with capturing the value of dead and dying trees and retaining those trees that were less likely to be attacked by the beetle, would have to be developed. Therefore, the primary impetus for preparing this Supplemental Environmental Assessment is to describe and analyze the newly developed Alternative D for the Tyler Creek Timber Sale **(See Exhibit #7)**. This newly developed Alternative D would have the following objectives-

- Harvest approximately 2.5 million board feet (MMBF) of sawtimber from 359 acres to

generate a net positive rate of return for the Common School (CS) Grant.

- To capture the value of those trees, in particular the large, high value Douglas fir trees, which have been or are highly likely to be killed before it is lost.

- To change the distribution of trees which would be left following the harvesting operation from those trees which are most susceptible to beetle attack (i.e. large, old, Douglas-fir) to trees which have a higher likelihood of either not being attacked by beetles or of surviving a beetle attack.

Exhibit #3-Large Douglas-fir trees that have been killed by the Douglas-fir Beetle.

Exhibit #2-Douglas Fir Beetle mortality along the northern boundary of section 36.

Exhibit #4-Douglas-fir Beetle mortality along the western boundary of section 36.

Exhibit #5-Typical area of Douglas-fir Beetle mortality within proposed harvest unit #8.

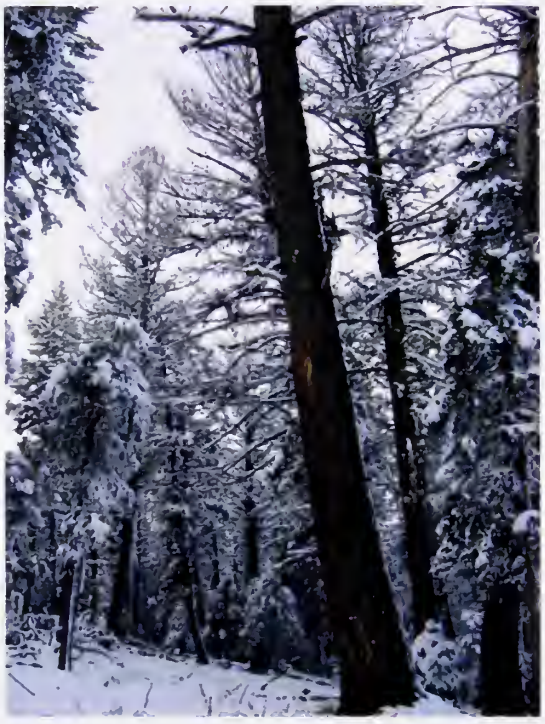
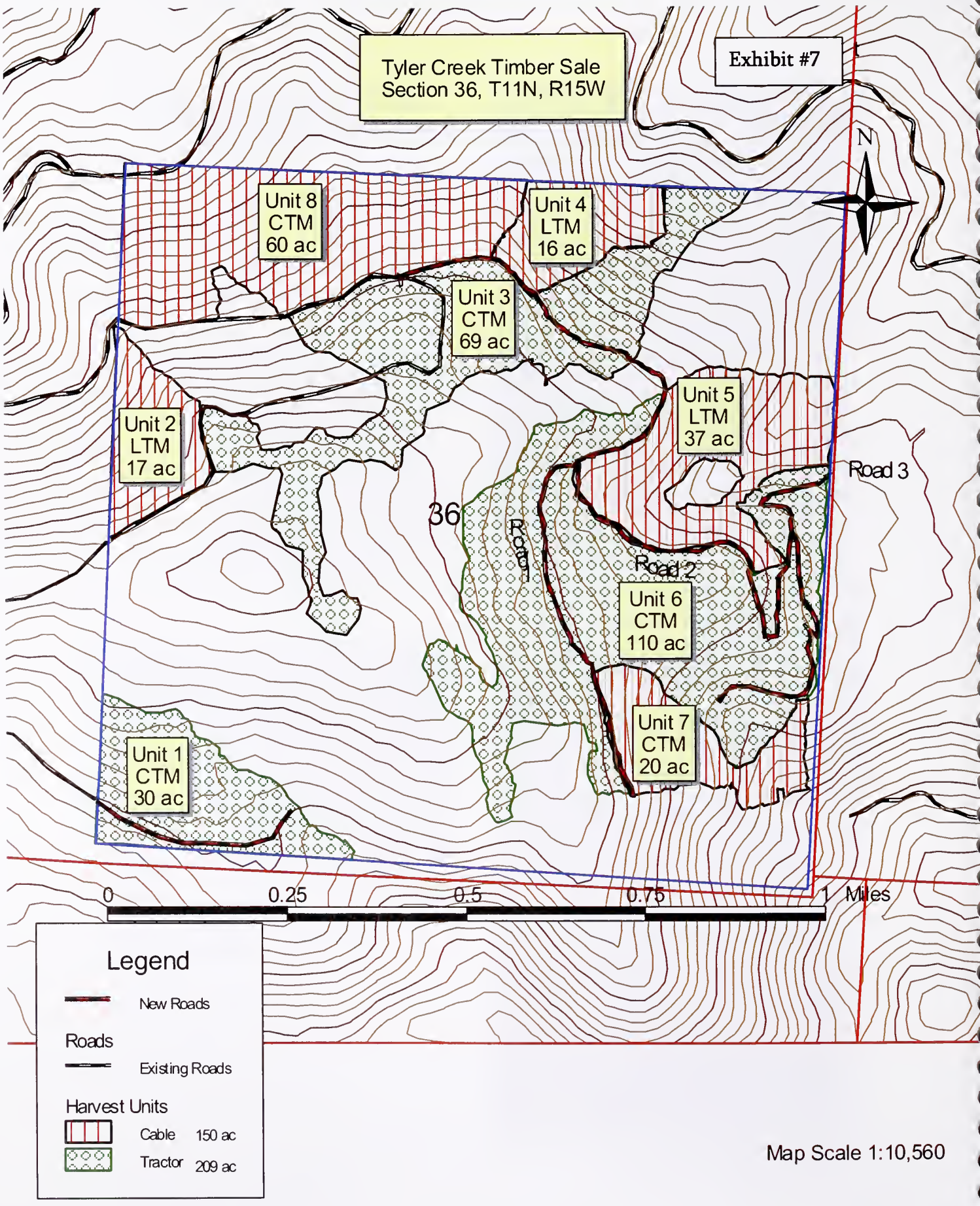


Exhibit #6-Area of Douglas-fir Beetle mortality within proposed harvest unit #3.

NOTE: All of the preceding photos were taken on April 14, 2005.


Tyler Creek Timber Sale
Section 36, T11N, R15W
Exhibit #7
N
Unit 8
CTM
60 ac
Unit 4
LTM
16 ac
Unit 3
CTM
69 ac
Unit 2
LTM
17 ac
Unit 5
LTM
37 ac
Road 3
36
Road 1
Road 2
Unit 6
CTM
110 ac
Unit 7
CTM
20 ac
Unit 1
CTM
30 ac
0
0.25
0.5
0.75
1 Miles
Legend
New Roads
Roads
Existing Roads
Harvest Units
Cable 150 ac
Tractor 209 ac
Map Scale 1:10,560

DESCRIPTION-ALTERNATIVE D-

When Alternative B, as presented in the project EA, was selected by the Decision Maker, the timber marking that followed was implemented in such a way as to favor the larger trees on the site, i.e. very few trees over 21" dbh were to be cut. Instead, the focus was on removing smaller trees, in particular Douglas fir, which were competing with the older more decadent trees. Given the current beetle infestation, had Alternative B been implemented as marked, those trees which are most likely to avoid beetle attacks would have been removed while those trees which either are currently infested or have a high likelihood of being infested would have remained on the site.

In designing Alternative D, the following dynamics of the Douglas fir beetle were taken into consideration-

- Hagle et. al. (2003) indicates that trees less than 12" diameter breast height (dbh) are "seldom attacked" by the Douglas fir beetle. Field surveys within the Tyler Creek project area support this contention.

- Schmitz and Gibson (1996) state that epidemic populations of the Douglas fir beetle coincide with periods of drought and will usually persist until drought conditions are relieved. They also indicate that the greatest amount of damage caused by the beetle typically occurs in unmanaged stands and attacks are most successful on trees that are mature, overmature, largest in diameter, and found in more densely stocked stands. Again, field surveys within the Tyler Creek project area support this contention.

As a result Alternative D was designed with the following parameters:

1. Douglas fir trees that were over 12" dbh were to be selected for harvest in stands where suitable leave trees less than 12" dbh could be retained. However, the intent of Alternative D was not to remove all Douglas fir over 12", rather trees within this size class were to be retained throughout the proposed cutting units where they were healthy and the removal of adjacent less healthy trees would hopefully reduce the stand density to a point (60-70 sq. ft. /acre basal area) that was less favorable to beetle attack.

2. Trees, including those over 21" dbh, that had been killed, or were dying from beetle attack were to be harvested if it appeared that they still had some commercial value.

3. DNRC Forest Management Rules for Snags and Snag Recruits (ARM 36.11.411) require a minimum retention of one snag and one snag recruit over 21" dbh per acre, in the habitat types found within the proposed project area. However, it was decided that due to the low numbers of snags found adjacent to the state ownership that additional snags and snag recruits over 21" dbh per acre would be retained, where available, within the cutting units proposed for this sale.

4. Those areas where lodgepole pine is the predominant species, and evidence of beetle infestation is present, would have all of the mature lodgepole pine removed. This would emulate the stand replacement fire events, which typically occur in pure stands of lodgepole pine and would capture the value of trees that are likely to succumb to Mountain Pine Beetle for the School Trust.

EFFECTS OF THE PROPOSED ALTERNATIVE D ON ISSUES ADDRESSED IN THE ORIGINAL PROJECT EA-

Analysis Area

An Analysis Area was developed to assess existing conditions and environmental consequences, as well as cumulative effects, of the proposed action for threatened and endangered, sensitive, and big game species. This area was generally described by a polygon inclusive of all lands within one mile of the parcel where treatment was proposed. For some species, where it was biologically justified, a larger Analysis Area was delineated. Any divergence from the general Analysis Area was described in the narrative for that species. If no description of the Analysis Area is included in the narrative for a species, then the general Analysis Area described above was used. For clarity, "Project Area" referred to the area within the boundaries of the proposed harvest.

THREATENED AND ENDANGERED SPECIES

Mitigations common to all threatened and endangered species: If any threatened or endangered species were to be encountered during project planning or implementation, all project-related activities would cease and a DNRC wildlife biologist would be informed immediately. Additional habitat protection measures would be designed and implemented as appropriate.

Affected Environment: Bald Eagle

Issue: There is concern that timber harvesting could alter habitat or create disturbance that would be detrimental to bald eagles.

Bald eagles likely occur both inside and outside of the Analysis Area, primarily associated with the Clark Fork River, which is approximately 1.5 to 2.0 miles distant from the Project Area to the north. Bald Eagles are listed as a Threatened species in Montana under the Endangered Species Act (ESA). Forest habitats frequented by bald eagles are typically along the periphery of lakes and reservoirs ≥ 32 hectares or near (<1 mile) forested corridors of major rivers (Wright and Escano1986). Bald eagles show a strong preference for multi-layered, mature or old growth forest stands with large emergent trees and snags for nesting and perching sites (MBEWG 1991). Winter habitat generally occurs near local food concentrations, generally along major river drainages and around large lakes (MBEWG 1991).

Known nest sites and nesting habitat: Bald eagles nest and winter along the Clark Fork River, however no bald eagle nest sites or roosting habitats are known to occur within the Project Area. The closest known nests are the Bearmouth nest site located approximately 1.75 miles to the north, the Nimrod nest site located approximately 2.5 miles distant to the northwest, and the Mulkey Oxbow nest site located approximately 6.5 miles to the northeast along the Clark Fork River (Christy DuBois, Montana Fish, Wildlife, and Parks, pers. comm., 12/1/04). The Bearmouth nest was located in 2004 and fledged two young

while the Nimrod nesting territory failed after the nest was blown out of the tree during nesting season (Christy DuBois, Montana Fish, Wildlife, and Parks, pers. comm., 12/1/04). The Mulkey Oxbow nest was also thought to have failed in 2004 (Christy DuBois, Montana Fish, Wildlife, and Parks, pers. comm., 12/1/04). Potential for use by nesting bald eagles is possible within the Project Area due to the availability of large trees preferred for nesting and perching, however the distance from the Clark Fork river makes use for nesting eagles less likely. Foraging by bald eagles is not likely within the Analysis Area due to the distance to the Clark Fork River and the absence of other likely bald eagle foraging habitats in the Project Area.

Wintering areas: Bald eagles are known to winter on the Clark Fork River, however no known high concentration areas or communal roosts occur within the Project or Analysis Areas (pers. comm., MDFWP, 12/1/04). Wintering bald eagles generally roost and concentrate activity near open water (MBEWG 1991). Wintering eagles can also concentrate activity in areas with high densities of wintering ungulates where they forage on winter-killed carrion, especially in late winter. However, the Project and Analysis Areas generally do not contain high concentrations of wintering animals and therefore would not attract concentrations of wintering bald eagles.

Effects of the No-Action Alternative

If no harvest were to occur in the Project Area, large trees would continue to die from the current insect infestation. Suppressed and co-dominant trees would continue to compete with dominant trees, reducing overall stand vigor, increasing the risk of mortality to large trees not currently infested. In the short term (10-20 years), the insect infestation and current competition will result in the creation of medium to large sized snags and coarse woody debris, however loss of the existing large trees will likely increase over time. Continued mortality due to existing conditions will likely increase the potential for a stand replacing fire disturbance, which would likely eliminate structural features important to bald eagles.

From the standpoint of cumulative effects, extensive harvesting on adjacent lands to the north has generally removed potential bald eagle nesting/roosting habitat within the Analysis Area. Federal lands to the south include the 6,000 acre Grouse-Silver King Roadless Area which contains 2,600 acres of old growth habitat which is not likely to be removed in the near future (Decision Notice, Harvey-Eightmile FEIS, Deerlodge National Forest). However, these areas have a very low likelihood of use due to the distance from quality foraging habitat in and adjacent to the Clark Fork River. Consequently, the low likelihood of use by nesting bald eagles results in no cumulative effects resulting from selection of the No-Action Alternative in the short term, with only minor potential effects in the long term if fire disturbances occur as a result of the conditions within the Project Area.

Effects of Alternative D

If the proposed harvest activities were implemented, dead and dying large Douglas-fir trees would be removed, reducing potential structure for nesting/roosting bald eagles. Suppressed and sub-dominant trees would also be removed, resulting in reduced competition within the stand and potentially increasing the vigor of residual large trees. Douglas fir dominates large trees within the Project Area, with some ponderosa pine in openings in the west and southwestern portions of the Project Area. Douglas-fir trees showing signs of insect infestation would be targeted for removal. Approximately 4 to 6 of these large Douglas fir trees and snags per acre would be retained for snag and snag recruitment trees. Ponderosa pine over 19" dbh would not be harvested unless taken to facilitate harvest operations.

When all live large trees (≥19" dbh) are considered, approximately 22% (2 trees per acre harvested/9 trees per acre pre-harvest) would be harvested under Alternative D. Approximately 2 live Douglas fir over 19" dbh harvested were likely to be harvested and approximately 4 large Douglas fir would be retained. Consequently, there would be very minimal negative effect on potential bald eagle nesting habitat in the short term as all large ponderosa pine and most large Douglas fir that would likely provide potential nesting structures would be retained in the Project Area.

From a cumulative effects standpoint, decreasing the risk of stand level disturbances in the future and increasing the vigor of large residual ponderosa pine and Douglas-fir trees would benefit bald eagles over time. Treated stands would be reduced in structural complexity in the near term but would develop greater structural complexity over the long term by reducing risks of individual tree and stand level disturbances.

Disturbance resulting from timber harvest activities (machinery operation, tree falling, etc.) can affect bald eagles in nesting sites and winter concentration areas (MBEWG 1991). However, the closest known nest site is too distant (1.75 miles) to be negatively affected by harvest activities on the Project Area and no known winter concentration or communal roosting sites are located within the Analysis Area.

Harvesting on adjacent private lands to the north is likely to be rare over the short term due to the existing low merchantable stocking levels that has resulted from intensive past harvesting. In summary, there would be minimal negative direct effects and positive indirect/cumulative effects to bald eagles as a result of implementation of the proposed harvest.

Affected Environment: Grizzly Bear

Issue: There is concern that timber harvest and associated activities could alter habitat or create disturbance that would be detrimental to grizzly bears.

Grizzly bears are currently classified as Threatened in Montana under the ESA. Grizzly bears are a wide-ranging species and therefore a larger Analysis Area was necessary to assess effects. The Analysis Area used in this assessment was selected to represent the most likely, or viable area for use by grizzly bears. The boundary is approximated by the area from Interstate 90 near the mouth of Harvey creek, then west along the Interstate to the mouth of Rock Creek, then south along Rock Creek to the mouth of Upper Willow Creek, then up South Fork Spring Creek to Black Pine Ridge, then up Black Pine Ridge to the headwaters of South Fork Lower Willow Creek, down South Fork Lower Willow Creek to the intersection with Spring Creek, then northwest along Spring Creek to the eastern hydrologic divide of Harvey Creek, then down Harvey Creek its mouth. This area could generally be described as encompassing the eastern portion of Rock creek drainage, the Upper Willow Creek drainage, the Harvey Creek drainage, and the western portions of Lower Willow and Spring creek drainages. Federal lands administered by the Lolo and Deerlodge National Forests, with private lands in the north and east, dominate this area. This area has low road densities on most of the federal lands, however the northern portion, where the project area is located, is dominated by corporate forest lands with the resultant high road densities, while the eastern portions are dominated by large agricultural operations with moderate to low road densities and some open range ranch operations.

Grizzly bears utilize a wide range of habitats, from low elevation riparian areas to high elevation berry fields, however habitat use is greatly influenced by the presence of

human activity, which can result in bear-human conflicts that can increase grizzly bear mortality risk. Human access to preferred habitats, as represented by total and open road densities, is therefore an important factor in grizzly bear habitat use. The proposed harvest activities are just over 25 miles distant, and separated by a major highway (i.e. Montana 200), and a major interstate freeway (US 90) from the Northern Continental Divide Grizzly Bear Ecosystem. However, grizzly bear activity has been reported in the area south and west of the Project Area in the headwaters of Willow, Gillespie, Tyler, and Bateman creeks (J. Jonkel, Montana Fish, Wildlife, and Parks, pers. comm., 14 December 2004). A grizzly bear was known to occur in the Rock Creek-Hogback Peak area during 2001-2002 and it is likely that this bear, or another bear, is still located in the Analysis Area (J. Jonkel, Montana Fish, Wildlife, and Parks, pers. comm., 14 December 2004). Therefore, the likelihood of use by grizzly bears within the Analysis Area in the near term is high. However, the northern portion of the Analysis Area, where the Project Area is located, is highly roaded and located near the Interstate corridor and so the likelihood of consistent, long term use by grizzly bears in the Project Area is low. The likelihood of use is high in the area south of the Project Area where road density and human access are low. The northern portion of the Analysis Area, including the Project Area, is likely an area that grizzly bears may move through in the process of moving to the higher quality grizzly bear habitats to the south (J. Jonkel, Montana Fish, Wildlife, and Parks, pers. comm., 14 December 2004).

Grizzly bears utilize low elevation riparian areas in the spring, where they feed on grasses and forbs. In addition, grizzly bears forage in big game winter range areas in the spring in search of winter-killed carrion. The Clark Fork River in the northern portion of the Analysis Area is a high quality low elevation riparian area that would be preferred by grizzly bears. However, the presence of a major highway complex and dispersed, but extensive human development in and near the northern portion of the Analysis Area, greatly reduce the value of these habitats and likely preclude consistent use of this area by grizzly bears. Within the Project Area, existing riparian areas generally do not contain large amounts of high quality riparian habitat that would provide extended foraging opportunities for grizzly bears. Within the Analysis Area, the upper Willow and Harvey drainages, as well as tributaries to Rock Creek, likely provide high quality spring bear habitat. The eastern portion of the Analysis Area and adjacent lower elevation areas dominated by private ranching operations is likely important for grizzly bears, especially areas where dead livestock are collected (i.e. bone yards) and around gut piles produced during hunting seasons (J. Jonkel, Montana Fish, Wildlife, and Parks, pers. comm., 14 December 2004).

Effects of the No-Action Alternative

If no harvest were to occur within the Project Area, no new roads would be constructed resulting in no change in human access. Cover would be reduced only slightly over the short term, however the continued reduction in stand vigor resulting from the current insect infestation and continued competition could increase the risk of a stand replacing fire event that could reduce cover values. However, the high road densities (>3 miles/sq. mile) on private lands dominating the northern portion of the Analysis Area, especially adjacent to the Project Area, reduce the likelihood of frequent use by grizzly bears. In addition, the low quality of seasonal habitats within the Project Area, the close proximity of human development, and the separation of the Project Area from existing grizzly bear recovery areas likely reduces the potential for consistent, long term use of the Project area by grizzly bears.

From a cumulative effects standpoint, adjacent private lands in the northern portion of the Analysis Area would likely continue to

be managed intensively for timber production, resulting in continued high road densities and low cover availability. Roadless areas and areas with low road densities on federal lands to the south will not likely be changed in the near future and would not be affected by the proposed activity. Continued development is also likely on private lands within the interstate corridor, which will likely further reduce habitat values for grizzly bears. Therefore, under the No-Action Alternative, the habitat in the Project Area would continue to be of low quality, with the potential for continued reductions if wild fire occurred. There would be minimal to no effect on habitats in the Analysis Area. Cumulative effects would be minimal due to the low quality of existing habitat and the consequent low potential for grizzly bear use around the Project Area.

Effects of Alternative D

Implementation of Alternative D would result in increased road density and decreased cover. A total of approximately 2.77 miles of new road would be constructed to access the Project Area. All new roads would be located behind two road closure structures and public access would be restricted year around. Cover would be reduced, however the moderate levels of retention would provide some screening cover within the Project Area. In addition, an unharvested corridor would be maintained through the Project Area to maintain cover to facilitate movement potential. Implementation of Alternative D would result in some degradation of habitat values for grizzly bears in a small portion of the Analysis Area, primarily as a result of increased human access and decreased core habitat. However there would be minimal risk to grizzly bears due to the low potential for grizzly bear use resulting from the existing high road densities (>3 miles/sq. mile) on private lands dominating the northern portion of the Analysis Area, the low quality of seasonal habitats within the Project Area, the close proximity of human development in the Project Area, and the relative isolation of the Project and Analysis Areas from grizzly bear recovery areas by a major highway and an interstate corridor.

From a cumulative effects standpoint, continued intensive management of adjacent private lands for timber production, resulting in continued high road densities and low cover availability coupled with continued human development on private lands within the interstate corridor will continue to reduce habitat values for grizzly bears around the Project Area. Implementation of Alternative D would not likely result in changes in access in adjacent parcels. Overall, there would likely be some minimal cumulative effects on grizzly bears as habitat would continue to be of low quality, with the potential for continued reductions, and the likelihood of use by grizzly bears would continue to be low.

Affected Environment: Gray Wolf

Issue: There is concern that timber harvesting and associated activities could alter habitat or create disturbance that would be detrimental to gray wolves.

Wolves are currently classified as endangered in Montana under the ESA. Due to the large territories of wolf packs, the Analysis Area described for grizzly bears will be used for this analysis also. There are no documented denning sites or known consistent use areas within the Project Area and there are no verified den sites in the Analysis Area (Joe Fontaine, USFWS, pers. comm., 12/9/04). The closest historical wolf pack is the Willow pack located south of the Project Area, which ranged to within a few miles south of the Project Area to over 20 miles south. The alpha female of this pack, which was radio collared, was killed and the remaining wolves are though to be utilizing an area just east and north of the previous range (Joe Fontaine, USFWS, pers. comm., 12/9/04). The next closest wolf pack (Blanchard Creek) and an

undefined activity area have been documented north of the Project and Analysis Areas (Joe Fontaine, USFWS, pers. comm., 12/9/04). Both areas are north of the I90 corridor distant 20 and 10 miles respectively. The Project Area and eastern portion of the Analysis Area appear to be a corridor of movement for wolves dispersing from the established wolf packs to the north. Based on the known wolf activity, it is highly likely that wolves occur in the Analysis Area and may move through the Project Area.

Wolves are wide ranging and forage primarily on big game. The Analysis Area generally does not contain big game winter range with large concentrations of animals, although deer and elk utilize the Project Area during winter. Radio telemetry data suggested that this area functions as a movement corridor for elk moving from low elevation areas to roadless areas around Grouse Gulch (Canfield 1991). Canfield (1991) found that security habitats during the hunting season were "almost exclusively" within the Silver King roadless area. Big game security habitat in the Moyie-Grouse elk management unit was estimated at 34% (Canfield 1991) and would be reduced to approximately 31% if all security habitat in Section 36 were eliminated (draft Tyler Creek EA, 1998). The minimum level of security within a fall home range was set as 30% (Canfield 1991), meaning that if all security habitat were eliminated in the Project Area it would still be above that minimum threshold suggested to "hold" elk and assure acceptable bull elk survival. The area likely functions as winter thermal cover for deer.

Effects of the No-Action Alternative

If no harvest were to occur in the Project Area, there would be no changes in cover or road density. Although cover and road density can have some direct effect on wolf mortality, the primary concern would be related to affects on big game populations in the Analysis Area. Not implementing Alternative D would have some minor short term benefit on wolf prey base by maintaining deer wintering areas and existing low hunter access conditions which provides security habitat for deer and elk. However the existence of high road densities within the Analysis Area, the lack of large concentrations of big game that would be a potential focus of wolf activity, and the dispersed yet extensive human development in the area immediately around the Project Area would likely reduce potential consistent, long term use of this area by wolves.

The existing insect infestation would likely continue under the No-Action Alternative, which would continue to degrade winter thermal cover values for deer. The potential for stand replacing fire would continue to escalate and could result in negative effects to wolf prey by reducing cover values. Consequently, there would likely be minimal to no direct effects, and potential for long term negative effects on wolves from selection of the No-Action Alternative.

From a cumulative effects standpoint, the area around the Project Area is dominated by private commercial forestland that is managed intensively for timber production. This has resulted in high road densities within the Analysis Area and low cover values resulting from the dominance of early successional forest types. In addition, small private land holdings along the Interstate corridor will likely continue to be developed for human use, resulting in some potential negative effects to wolf habitat. However no additional cumulative effects on wolves would be anticipated as a result of selecting the No Action Alternative.

Effects of Alternative D

Implementation of Alternative D would result in reductions in cover and increases in road density. Winter thermal cover for deer would be reduced as a result of implementation of Alternative D. Some security habitat would be removed in the

harvest, although the overall security habitat in the elk analysis area is above proposed thresholds after harvest. In addition, the moderate level of retention throughout the proposed harvest units would maintain some level of cover, the closed status of the roads would minimize motorized access, and the retention of a movement corridor within the Project Area would provide retention of winter thermal cover for deer and escape cover for deer and elk moving through the Project Area. Consequently, there would likely be some minimal effect on wolf forage availability as a result of the proposed harvest.

Cumulative effects resulting from Alternative D would be minimal to non-existent due to the low likelihood of use by wolves as a result of the existence of high road densities and low cover values on private lands dominating the Analysis Area and the lack of key big game winter range in the Project Area. Implementation of Alternative D could result in some positive effects on wolf prey by reducing the potential for stand replacing wildfire, which could result in the retention over a longer time period of some thermal and security cover, albeit in a reduced state after treatment. Small private land holdings along the Interstate corridor will likely continue to be developed for human use, resulting in the potential for negative effects to wolf habitat. However this would have minimal effects on wolves since big game populations (i.e. wolf prey sources) are not likely to be greatly affected and the dispersed but intensive human development in the area immediately adjacent to the Project Area would greatly reduce the potential for extended use by wolves.

Affected Environment: Lynx

Issue: There is concern that timber harvesting could alter habitat or create disturbance that would be detrimental to lynx.

The lynx is currently listed in Montana as a threatened species under the ESA. Lynx are a forest dwelling, medium sized carnivore with home ranges averaging between 43 and 115 km^2 in Montana studies (Aubry et al. 1999). Due to these large home ranges, the Analysis Area used in the grizzly bear and wolf assessment will be used here.

Although we lack specific information on optimum habitats and conditions that provide for lynx and their prey in western Montana (Ruggiero and McKelvey 1999), an intensive lynx study has been conducted in the Seeley Lake area approximately 35 miles to the north and in the Garnet Range across the Interstate immediately north of the Analysis Area. From this research, it has been found that lynx generally occur between 1,200 m and 2,100 m in elevation in forests dominated by mesic mixed forest composed primarily of Douglas fir, western larch, and lodgepole pine at lower elevations and subalpine fir, whitebark pine, and Engelmann spruce at upper elevations (Aubry et al. 1999). The primary prey species of lynx are snowshoe hares and habitat use occurs predominantly in early to mid-successional stands that produce high densities of hares. Lynx also appear to avoid openings with little cover or foraging opportunity (Aubry et al. 1999). Lynx denning habitat is less well documented, however denning stands are generally characterized as mature to old, subalpine fir and Engelmann spruce dominated stands on moist sites (north facing slopes) with moderate to high canopy closure (i.e. at least 50% canopy closure) and accumulations of coarse woody debris (i.e. at least 40 logs/50 m) that provide security and escape cover for kittens (Koehler 1990, Koehler and Brittell 1990).

Although within the elevation range of the species (5000 – 6000 feet), the forest types found in the Project Area are generally dominated by warm, dry vegetation and stands composed primarily of dry Douglas fir with scattered ponderosa pine. These forest types are not preferred by lynx. Some lynx occurrence has been noted in the literature within Douglas fir and lodgepole pine forests,

however these areas have generally been associated with areas of boreal forest dominated by subalpine fir and Engelmann spruce (Aubry et al. 1999). Within the Project Area, there are several stands that are habitat typed as Douglas-fir/blue huckleberry, which may be considered secondary lynx habitat and therefore may provide some potential as lynx denning and/or travel habitat. A small stand composed of lodgepole pine exists within the Project Area, however this stand is relatively small and isolated, and will not be treated in Alternative D. More extensive subalpine fir, spruce, and lodgepole pine dominated forests, which would be considered, preferred lynx habitat are found to the east and southeast from 1.5 miles to over 10 miles distant from the Project Area. These habitats are generally on federal lands and at relatively low risk of manipulation. The portion of the Analysis Area directly adjacent to the Project Area (i.e. within 0.5 miles) is dominated by dry Douglas fir and ponderosa pine forest types not preferred by lynx. The structural conditions of the stands in the Project Area may provide some denning potential to lynx, as there is considerable downed woody debris, high canopy closure, and rocky areas in several localized areas. The paucity of preferred lynx habitat in the Project Area, the relatively small amount of lynx habitat, as defined by habitat types, overall in the Analysis Area, and the separation of Project and Analysis Areas from areas of more preferred habitat to the north by the Interstate suggests that it is not likely that lynx will use the Project Area for breeding or foraging, although some transient occurrence is possible.

Effects of the No-Action Alternative

The forest conditions in the Project Area would not generally be considered lynx habitat and consequently there is a very low likelihood of lynx occurrence. If the stands in the Project Area were not treated, there would likely be a short term increase in downed woody debris as large trees succumbed to the current insect infestation which would increase potential denning microsite structure within the Project Area. However, over the long term there is an increased likelihood of a stand replacing fire, which would remove any potential lynx habitat. Foraging habitat would be limited in the Project Area, although adjacent private lands provide some potential. The Project Area would continue to provide travel cover until, and unless a stand replacing fire event occurred. Consequently, if the No-Action Alternative were selected there may be some short-term benefit to potential lynx denning habitat, however over the long term there is a potential for negative effects as a result of increased fire risk. Cumulative effects would be minimal since there is relatively little lynx habitat within the Analysis Area and the Project Area and existing blocks of potential habitat exist in relatively secure areas on federal lands.

Effects of Alternative D

The forest conditions in the Project Area would not generally be considered preferred lynx habitat and consequently there is a very low likelihood of lynx occurrence. The stands in the Project Area may provide some secondary denning potential, foraging habitat is limited, and travel habitat is plentiful. The proposed treatments within the Project Area would reduce overhead cover and remove some future potential coarse woody debris, resulting in some negative effects to potential denning structure. The moderate to high level of post-treatment retention, coupled with the untreated corridor running through the Project Area would likely retain travel cover values. Foraging habitat may be increased slightly, however values would continue to be very low. Overall, stand replacing fire risk would likely be reduced, potentially maintaining travel and low quality denning habitat values over time. Therefore, there may be some minor short-term negative direct effects to lynx as a result of reducing secondary lynx denning habitat values by reducing potential den microsite structure. This effect is minimal due to the low

likelihood of use, the low quality of the available habitat, the paucity of habitat in the Analysis Area and the isolation from high quality habitats to the north by the Interstate, the retention of snags and large trees within the stands post-treatment which would continue to provide den microsite structure, and the moderate level of retention within post-treatment stands and the untreated corridor which would likely maintain travel potential. There is likely to be a long term, indirect positive effect to lynx as a result of the reduction in stand replacing fire risk as a result of the proposed treatment. There would not likely be any cumulative effects due to the paucity of lynx habitat in the Analysis Area, the low likelihood of use by lynx, and the relative isolation of the Project Area from blocks of preferred habitat on federal lands to the west and south.

SENSITIVE SPECIES

Affected Environment: Flammulated Owl

Issue: There is concern that timber harvesting could alter habitat or create disturbance that would be detrimental to the flammulated owl.

Flammulated owls occur mostly in mid-elevation conifer forests that have a significant old ponderosa pine component. They are known to occur on the Lolo National Forest in mature Douglas-fir/Ponderosa pine forests (Verner 1994). Flammulated owls appear to select open forest stands with large trees and snags for nesting and foraging (many authors cited in McCallum 1994). In addition, use areas have been found to have occasional clusters of thick vegetation for roosting (Howie and Ritchey 1987), and adjacent grassland or xeric shrubland openings that create edge foraging habitat (Wright 1996). Flammulated owls are secondary cavity nesters, usually utilizing cavities excavated by pileated woodpeckers in larger conifer trees (cited in McCallum 1994). Flammulated owls are insectivorous and utilize foraging techniques adapted to open forest conditions or forest/grassland edge habitats (cited in McCallum 1994).

Flammulated owl habitat occurs within the Project and Analysis Areas due to the presence of stands dominated by large Douglas fir and scattered large Ponderosa pine trees. However, no known occurrences of flammulated owls have been reported in the Analysis or Project Areas. The Project Area is composed of 359 acres of proposed harvest in three patches and is dominated by relatively dense, uneven-aged, intermediate to large, old Douglas fir dominated forest. Within the Project Area, large ponderosa pines are relatively rare and scattered, averaging approximately 2 ponderosa pine trees (≥19" dbh) per acre.

Effects of the No-Action Alternative

Without the proposed harvest, large Douglas fir and ponderosa pine trees would continue to experience mortality due to the current insect infestation. Competition with encroaching smaller trees, mostly Douglas fir, would likely lead to accelerated mortality of the largest size class of trees. This would create additional nesting habitat for flammulated owls in the short term (i.e., several decades), but lead to long term deficits in nesting habitat due to the failure of smaller size classes to grow into larger size classes, especially for ponderosa pine. In addition, foraging habitat would continue to decline, as tree density remains high. Therefore, selection of the No-Action Alternative would have minor positive short-term effects and minor long-term negative effects on flammulated owls.

From a cumulative effects standpoint, intensive harvest on private lands adjacent to the Project Area has generally eliminated potential flammulated owl habitat. Residual mature and old forest types are available on federal lands to the south and west. In several

of these stands, pileated woodpeckers have been detected. A cluster of detections of pileated woodpeckers is located approximately 6 miles to the west. These areas have a relatively low likelihood of manipulation. If no harvest occurs, low quality flammulated owl habitat would be retained but there would be a continued, and potentially increasing risk of stand replacing wildfire which, depending on the severity of any future fire, could remove habitat for flammulated owls for an extended period of time (>100 years).

Effects of Alternative D

The proposed harvest activities are designed to reduce mortality due to the current insect infestation and reduce competition from encroaching Douglas fir on larger tree classes. Removal of primarily suppressed, and sub-dominant trees would open forest stands, creating better foraging conditions for flammulated owls. Removal of dense, smaller tree patches in the Project Area could affect roosting habitat, however, retention within the no-cut corridor would provide potential roosting habitat. Harvest of large trees that are infested and dead or dying would reduce current and future availability of roosting and nesting trees. However, approximately 4 to 6 large Douglas-fir trees and snags per acre would be retained for snag and snag recruitment trees. Ponderosa pine over 19" dbh would not be harvested unless taken to facilitate harvest operations. When all live large trees (≥19" dbh) are considered, approximately 22% (2 trees per acre harvested/9 trees per acre pre-harvest) would be harvested under Alternative D. In general, snags that are not a safety hazard would be retained and removal of smaller, suppressed, trees should also result in increased vigor in the retained live trees, thereby increasing recruitment potential into the large tree class over time. Woodcutters can affect density of retained snags, and the proposed harvest includes the building of 2.77 miles of new road. However, this road is located behind two gates that are closed year around to the public, which reduces the potential of snags being removed for firewood. Finally, reducing stem density would create more open forest conditions that would be more preferred by flammulated owls for foraging. Consequently, the retention of all large ponderosa pine, thinning of dense stands, retention of large snags, and retention of a no harvest corridor for potential roosting habitat, results in no to minor positive direct effects on flammulated owl habitat.

The proposed harvest activity would reduce the risks of disease, insect, and wildfire disturbances, returning these stands to more historical conditions. Thinning the smaller trees while retaining healthy large trees would decrease competitive stress on the remaining large trees, especially ponderosa pine, while encouraging medium-sized trees to grow larger and serve as long term replacements to the largest tree cohort. Although this may reduce tree density and roosting habitat conditions in the short term, by slowing the mortality of large trees and removing some larger trees in areas of high density, proposed treatments would provide more stable, higher quality (i.e. better foraging habitat with retention of most nesting and roosting habitat) conditions within the harvest units over the long term. Consequently, implementation of Alternative D would result in positive effects to flammulated owls over the long term.

From a cumulative effects standpoint, suitable flammulated owl habitat is limited in the Analysis Area due to intensive harvesting on private lands that has created early successional types not suitable for flammulated nesting activity, and the effects of fire suppression that has increased stand density within historically open ponderosa pine stands. Therefore, the proposed treatment would improve flammulated owl habitat by improving foraging habitat, retaining nesting structure, and retaining patches of denser structure in no-harvest areas that can serve as roosting habitat. In addition, reducing the risks of stand replacing disturbances would

result in longer-term stability of the suitable flammulated owl habitat. Consequently, there would be minor positive cumulative effects to flammulated owls by implementing the proposed Action Alternative.

Affected Environment: Pileated Woodpecker

Issue: There is concern that timber harvesting could alter habitat and create disturbance that would be detrimental to pileated woodpeckers.

Pileated woodpeckers likely occur within the Project and Analysis Areas. Pileated woodpeckers prefer mature and old growth conifer forest with a canopy dominated by large western larch or ponderosa pine. Mature aspen and cottonwood stands are also used by pileated woodpeckers. Pileated woodpeckers typically do not nest in trees less than 15" dbh, and preferred trees are generally over 20" dbh. Sufficient large snags and coarse woody debris are important components of pileated woodpecker habitat.

The Project Area has stand structure suitable for pileated woodpecker foraging use. In addition, the presence of the current insect infestation is likely beneficial to pileated woodpeckers by increasing the large standing dead tree (snag) component within stands. Medium-sized Douglas fir with scattered individual trees and clumps of large Douglas fir and ponderosa pine dominates the Project Area. The stands within the project area proposed for harvest have approximately 7 live trees and 2 snags over 21" dbh.

Effects of the No-Action Alternative

Without the proposed harvest, large trees, especially Douglas fir, would continue to succumb to the current insect infestation. This would create additional nesting and foraging habitat for pileated woodpeckers in the short term (several decades) by the creation of large snags. Over the long term, as the large tree component within the Project Area is removed by natural mortality, the stands will be dominated by small to medium sized Douglas-fir and the amount of nesting habitat would decline.

Under the No Action Alternative, there would be a continued, and potentially increasing, risk of stand replacing wildfire. Hutto (1995) found that pileated woodpeckers did occur in burned forests, but he suggested that they require a mix of forest types and they are generally always detected near intact forest. Therefore, stand replacing fire could result in an increase in foraging substrate, but lower long-term nesting suitability, which would be dependent upon the actual extent and intensity of the particular fire event, should one occur. In summary, short-term (several decades) nesting and foraging habitat conditions would be enhanced for pileated woodpeckers under the No Action Alternative, however, long-term (>50 years) sustainability of nesting habitat would decline due to attrition in large ponderosa pine and overall structure could be compromised due to the expected high risk of stand replacing wildfire.

From a cumulative effects standpoint, pileated woodpecker habitat within the Analysis Area is limited due to ownership patterns that have created a landscape dominated by intensive harvesting over the past 20 years. Without harvesting, risks of long-term reductions in the large ponderosa pine component of proposed harvest stands would continue, as would risks of stand replacing wildfire. Although habitat may increase over the short term, there would be a long-term cumulative effect to pileated woodpeckers as the remaining suitable habitats were reduced in value or eliminated over time. Adjacent private lands are dominated by small to medium trees with very few large trees. Pileated woodpeckers have been detected outside of the Analysis Area, approximately 6 miles to the west. Federal lands to the south and west would likely provide quality pileated

woodpecker habitat and are at low risk of manipulation.

Effects of Alternative D

If the proposed harvest activities are implemented, dead and dying large Douglas-fir trees would be removed, reducing potential roosting, foraging, and nesting habitat for pileated woodpeckers. Suppressed and sub-dominant trees would also be removed, resulting in reduced competition within the stand and potentially increasing the vigor of residual large trees. Douglas fir dominates large trees within the Project Area, with some ponderosa pine in openings in the west and southwestern portions of the Project Area. Douglas-fir trees showing signs of insect infestation would be targeted for removal. Approximately 4 to 6 of these large Douglas fir trees and snags per acre would be retained for snag and snag recruitment trees. Ponderosa pine over 19" dbh would not be harvested unless taken to facilitate harvest operations. When all live large trees (≥19" dbh) are considered, approximately 22% (2 trees per acre harvested/9 trees per acre pre-harvest) would be harvested under Alternative D. Approximately 2 live Douglas fir over 19" dbh were likely to be harvested and approximately 4 large Douglas fir would be retained. Consequently, there would be a short-term negative effect on potential pileated woodpecker habitat resulting from the removal of large dead and dying, insect infested trees in the Project Area. The retention of large trees throughout the Project Area and the retention of the approximately 249-acre no-harvest corridor would reduce the potential effect on pileated woodpeckers. Decreasing the risk of stand level disturbances in the future could benefit pileated woodpecker if it reduced the potential of an extensive, high intensity, stand replacing fire event, which would create habitat poorly suited for pileated woodpeckers. Lower intensity, mosaic-burning events may actually increase habitat values by creating a mix of areas with many dead trees and areas of residual live trees.

The proposed harvest activity would reduce the risks of disease, insect, and wildfire disturbances, returning these stands to more historical conditions. Thinning the smaller trees while retaining most of the large trees would decrease competitive stress on the remaining large trees, especially ponderosa pine, while encouraging medium-sized trees to grow larger and serve as long term replacements to the largest tree cohort. Although this may reduce habitat quality in the short term by thinning dense forest structure preferred by pileated woodpeckers and reducing foraging, roosting, and nesting tree density, over the long term it would provide more stable conditions within the harvest units by slowing the mortality of large ponderosa pine trees, and maintaining them in a condition of lowered risk.

In summary, there would be some negative effect on potential pileated woodpecker nesting, roosting, and foraging habitat in the short term resulting from the removal of large, dead and dying trees in the Project Area. However, this effect is minimized by the high level of retention of large dead and dying Douglas-fir, the retention of most large ponderosa pine which are preferred for nesting, and the retention of all dead and dying trees in the no-harvest corridor. Woodcutters can affect density of retained snags, and the proposed harvest includes the building of 2.77 miles of new road. However, this road is located behind two gates that are closed year around to the public, which reduces the potential of snags being removed for firewood.

From a cumulative effects standpoint, suitable pileated woodpecker habitat is limited in the Analysis Area due to intensive harvesting on private lands that has created early successional types not suitable for pileated woodpecker nesting activity. Extensive areas of high quality pileated woodpecker habitat are located outside the Analysis Area on federal lands to the west and

south. These areas are of low risk of future harvest disturbance and would not be affected by the Proposed Activity. Consequently, there are not likely to be any cumulative effects on pileated woodpeckers as a result of implementing Alternative D.

Affected Environment: Boreal Owl

Issue: There is concern that timber harvesting could alter habitat or create disturbance that would be detrimental to boreal owls.

Boreal owls prefer mature spruce/fir forests dominated by Englemann spruce. In these forest types, subalpine fir, Douglas fir, western larch and lodgepole pine can also be well-represented species (Hayward et al. 1987). Boreal owls tend to be confined to cool sites at elevations greater than 5,200 feet in elevation (Hayward et al. 1987). Elevations on this Project Area range from about 5,000-6,000 feet, which is generally within the elevational range of boreal owl habitat. However, mature and over mature spruce/fir habitats are virtually non-existent within the Project and Analysis Areas. Forest conditions in the Project Area are warmer and drier than those typically preferred by boreal owls. Therefore, the treatment sites involved in this project do not provide conditions normally considered suitable for boreal owls.

Effects of the No Action Alternative

Preferred boreal owl habitat does not occur on the Project or Analysis Areas and therefore no direct, indirect, or cumulative effect would be expected from adoption of the No-Action Alternative.

Effects of Alternative D

Preferred boreal owl habitat does not occur on the Project or Analysis Areas and therefore no direct, indirect, or cumulative effect would be expected from adoption of Alternative D.

Affected Environment: Fisher

Issue: There is concern that timber harvesting could alter habitat or create disturbance that would be detrimental to fishers.

Fishers prefer densely forested riparian old growth forests that have an abundance of coarse woody debris and large snags (≥30" dbh)(cited in Powell and Zielinski 1994). They also tend to use moist forest types at mid- to low elevation with mature to old forest structure (cited in Powell and Zielinski 1994). The Project Area is at relatively high elevation for fishers and composed of forest types that tend to be drier than preferred fisher habitats. In addition, while the stands proposed for treatment have attributes important to fishers (large old trees, downed woody debris), they are not located near developed riparian areas which would be preferred by fishers.

Effects of the No-Action Alternative

Without harvest, potential habitat would be maintained in its current condition. Although stands proposed for harvest have structural attributes important for fisher, no developed riparian areas exist within the project area reducing potential use by fishers. There would be a continued, and potentially increasing, risk of stand replacing wildfire, which could reduce the potential habitat existing by creating early successional habitats with open canopy closure not preferred by fishers. Therefore, there would be minimal to no short-term effects and the potential for minor long-term negative effects to fisher by selection of the No-Action Alternative.

Suitable fisher habitat within the Analysis Area is relatively limited outside of the proposed harvest parcels due to intensive harvesting on private lands and human development along the Clark Fork River

corridor. Habitat exists in areas outside the Analysis Area to the south and west, predominantly on federal lands. These lands are not likely to be manipulated in the near future. Due to the limited habitat potential found in the Project and Analysis Area, no measurable cumulative impacts to fishers would be anticipated by selection of the No-Action Alternative.

Effects of Alternative D

Removal of canopy closure and structural complexity within harvest units would potentially affect the quality of fisher habitat. However, the low likelihood of use by fisher greatly reduces any potential effects. Tyler Creek is the area most likely to be used by fishers within the Analysis Area and this area would not be entered during harvest activities. Retention of snags and coarse woody debris, large green cull trees, and most large (over 19" dbh) ponderosa pine trees would also benefit fishers by maintaining some level of structural complexity within the harvest units which provides habitat for fisher prey species as well as denning and resting habitats.

The proposed harvest activity would likely increase the vigor of the stands in the Project Area, resulting in a potential reduction in the future risks of disease, insect, and wildfire disturbances. Thinning the stands and removing insect infested trees would decrease competitive stress on the remaining large trees, especially ponderosa pine, while encouraging medium-sized trees to grow larger and serve as long term replacements to the largest tree cohort. Although this may reduce habitat conditions in the short term by reducing canopy closure and vertical structural diversity, over the long term it would provide more stable conditions within the harvest units and maintain the potential for future use of the harvest areas by fishers. Therefore, the minor effects discussed above, when considered with the low likelihood of use by fishers, would result in minor to no measurable effects to fisher or their habitat as a result of the proposed treatments.

Suitable fisher habitat is limited in the Analysis Area due to intensive harvesting on private lands that has created early successional types not preferred for fisher and continued human development along the Clark Fork River corridor. Considerable habitat exists on federal lands to the south and west, however these areas are at low risk to future manipulation. In the short term, the minor effects of the proposed treatments, when considered with the small amount of fisher habitat (i.e. no developed riparian areas) within the Analysis Area, result in no measurable cumulative effects to fishers from implementation of Alternative D. In the long term, the reduction in stand replacing fire risk within the Analysis Area as a result of implementing the proposed harvest would likely have some minor positive cumulative effect on fisher habitat.

Affected Environment: Black-backed Woodpecker

Issue: There is concern that timber harvesting could alter habitat or create disturbance that would be detrimental to black-backed woodpeckers.

Black-backed woodpeckers are closely associated with standing dead forests, created by large fires of high intensity (Hutto 1995). Burned forests tend to be used soon after fire events occur (~2-5 years), and large, densely stocked stands with an abundance of large trees of various species appear to provide the greatest benefit to black-backed woodpeckers (Heijl et al. 2000, Hitchcox 1996). Black-backed woodpeckers are also found in green forests with high levels of insect activity (Goggans et al. 1989). Black-backed woodpeckers are not migratory, but are known to undertake large movements in response to fire events. Therefore, a larger Analysis Area was established for the black-backed woodpecker analysis. The Analysis Area used

in this analysis was inclusive of a circle of all lands within a 10-mile radius of the Project Area.

An insect infestation of Douglas-fir bark beetles is currently active in the Project Area. Within the Analysis Area, there has been one wildfire over 500 acres in size in the past 5 years. The Ryan Gulch fire is located due north of the Project Area approximately 2 miles across the I90 corridor and was estimated to have a fire perimeter, which encompassed 17,718 acres. This fire occurred in 2000. This large fire event likely increased black-backed woodpecker populations, however this area is dominated by private timber company lands that were intensively managed prior to the fire, resulting in lower quality post-fire foraging habitat for black-backed woodpeckers, and has been, or will likely be intensively salvaged. Consequently, the impact on the black-backed woodpecker population may have been limited. However, the close proximity of this fire, coupled with the current insect infestation within the Project Area would indicate that preferred black-backed woodpecker habitat occurs within both the Project and Analysis Area and there is a likelihood that black-backed woodpeckers occur within the Project Area.

Effect of the No-Action Alternative

Without harvesting, the existing stands and forest structure would be retained in their present condition, which is black-backed woodpecker habitat due to the current insect infestation, which would have a positive effect on black-backed woodpeckers. Over the long term, the increasing risk of stand replacing fire under the No-Action Alternative could result in increases in black-backed woodpecker habitat. In the event of a future fire event, high quality black-backed woodpecker habitat would be created within the Project Area resulting in a positive effect on black-backed woodpeckers. There also could be some indirect beneficial cumulative effect to black-backed woodpeckers as a result of the increased potential of stand replacing fire due to selection of the No-Action Alternative.

Effects of Alternative D

The proposed harvest units in Alternative D are currently providing preferred black-backed woodpecker habitat, so treatment of these units would directly affect black-backed woodpecker habitat. Harvest within the Project Area would likely decrease the risk of stand replacing fire, thereby reducing the potential creation of future black-backed woodpecker habitat. The retention of an approximately 249 acre no-harvest corridor within the Project Area reduces the potential effect somewhat by retaining black-backed woodpecker habitat after harvest. The location of a large wild fire within the Analysis Area has likely increased the black-backed woodpecker population in this area and increased the likelihood of use by black-backed woodpeckers in the Project and Analysis Areas. Consequently, there would be the potential for some adverse indirect cumulative effect due to the reduction in stand replacing fire risk in the Project Area as a result of the proposed treatment. Intensive timber management and fire salvage on private lands likely has reduced the overall response of the existing black-backed woodpecker population and would likely reduce the potential benefits of a wildfire in the area directly adjacent to the Project Area.

Affected Environment: Peregrine Falcon

Issue: There is concern that timber harvesting could alter habitat or create disturbance that would be detrimental to peregrine falcons.

Peregrine falcons were de-listed from Threatened Species status under the ESA in 1999, but are maintained as a DNRC sensitive species. In Montana, peregrine falcons typically nest in areas with large rock and cliff

Northern Bog Lemming - Bogs and fens are absent from the Analysis Area and substantial moss development does not commonly occur within the Project Area therefore there would be no effects to northern bog lemmings from either of the Alternatives considered.

Columbian Sharp-tailed Grouse - No known populations of Columbian sharp-tailed grouse occur in the area and grassland habitats are not affected by the proposed Action Alternative hence there would be no effects to the species from the Alternatives considered.

Ferruginous Hawk - dry grassland, sagebrush plains, and saltbush/greasewood flats are absent from the Analysis Area and no known nest sites of ferruginous hawks occur within the Project or Analysis Area. Therefore there would be no effects from the Alternatives considered.

SPECIES CONSIDERED SENSITIVE BY THE MONTANA NATURAL HERITAGE PROGRAM

KEELED MOUNTAINSNAIL

Affected Environment: Keeled Mountainsnail

Issue: There is concern that timber harvesting could alter habitat or create disturbance that would be detrimental to Keeled Mountainsnails.

The Keeled Mountainsnail (*Oreohelix carinifera)* has been identified as a Species of Concern by the Montana Natural Heritage Program. Under their classification system, the snail is listed as G1-*At high risk of extremely limited and/or rapidly declining numbers, range and/or habitat, making it highly vulnerable to global extinction and/or extirpation in the state.* On May 18, 2005 a survey of the area of the proposed Tyler Creek Timber Sale was conducted in order to determine the presence/absence of Keeled Mountainsnail. The results of that survey indicated that these animals were most likely to be present on south facing slopes with relatively open (less than 20%) canopy cover. In addition, the snails were found in close association with limestone rocks and were rare to absent in areas of quartzite slopes.

Exhibit #8-Area of confirmed Keeled Mountainsnail habitat in proposed Cutting Unit #1.

Exhibit #9-Area of confirmed Keeled Mountainsnail habitat northwest and outside of Cutting Unit #1.

Effects of the No-Action Alternative

Implementation of the No-Action Alternative would allow those areas that are currently providing habitat for the Keeled Mountainsnail to remain in their existing condition and would not present a risk of site disturbance due to the passage of vehicles and/or logs during harvesting operations.

features. Foraging habitats are usually open areas such as marshes, estuaries and croplands. A small amount of such croplands (hay fields and grazing lands) occur just outside of the Analysis Area, and the Clark Fork River and associated wetland complexes would likely provide a small to moderate level of foraging habitat. Although minor rock outcroppings occur within the Analysis Area, preferred nesting cliffs are not available. The Montana Natural Heritage Database indicated that no nesting pairs of peregrine falcons are known to exist within the Analysis Area. Due to the lack of adequate nesting habitat, it is not likely that nesting peregrine falcons will occur within the Project or Analysis Area.

Effects of the No-Action Alternative

Due to the lack of potential use of the forested types within the Project Area by peregrine falcons for nesting and foraging, and the fact that peregrines are not known to nest in the Analysis Area, there would be no direct, indirect, or cumulative effects from adoption of the No-Action Alternative.

Effects of Alternative D

Due to the lack of potential use of the forested types within the Project Area by peregrine falcons for nesting and foraging, and the fact that peregrines are not known to nest in the Analysis Area, there would be no direct, indirect, or cumulative effects from adoption of Alternative D.

OTHER SENSITIVE SPECIES-

The following is an additional list of sensitive species that are known to occur, or could occasionally occur on State Trust Lands administered by the Southwestern Land Office. Due to limitations of available habitat, these species were determined to have a low likelihood of being adversely effected by this proposal or are not likely to occur in the vicinity of the activities proposed by Alternative D. Species occurrence records provided by the Montana Natural Heritage Program Database were also acquired and reviewed to document the presence or absence of these sensitive species in the Project Area vicinity. No impacts on any of these species are expected to occur as a result of the alternatives considered.

Coeur d' Alene Salamander - No availability of fractured rock associated with waterfalls or splash zones present within the Analysis Area. No known occurrences within the Analysis Area. Consequently, there would be no effect to Coeur d' Alene salamander habitat if either of the Alternatives considered were selected.

Common Loon - No lakes/ponds with adequate size or habitat values would be affected by Alternative D and no known occurrence of nesting common loons within the Analysis Area. Consequently, there would be no impacts to common loon by the Alternatives considered.

Harlequin Duck - Small sections of riparian habitat occur within the Project and Analysis Areas, however streams are very shallow with small substrate material and it is unlikely that harlequin ducks would occur within the Project Area. No known occurrences of harlequin duck within the Project Area. Hence there would be no effect from the Alternatives considered.

Mountain Plover - Shortgrass prairie habitats preferred by mountain plover do not occur within the Analysis Area. In addition, the proposed activities would have no effect on grassland habitats. No known local populations occur. Hence there would be no effect from the Alternatives considered.

Townsend's Big-Eared Bat - No known hibernacula occur in the Project Area. No mines are known to occur on the Project Area, and no impacts to Townsend's big-eared bats would be expected to occur from either of the Alternatives considered.

However, those conditions, which increase the risk of catastrophic wildfire within the proposed project area, would also pose a threat to the snail. Paul Hendricks, PhD of the Montana Natural Heritage Program concluded after the May 18, 2005 field survey that "catastrophic (stand replacement) wildfire could have a significant negative impact on the snails."

Effects of Alternative D

Implementation of Alternative D would pose a risk of disturbance to those sites that are currently or may in the future, provide habitat for the Keeled Mountainsnail. The primary cause of any potential disturbance to these areas would be the passage of vehicles and/or logs across the surface of the area thereby dislodging any limestone rocks that might provide suitable habitat for the snail. In addition, the snails appear to prefer areas with approximately 1-3" of duff. The passage of vehicles and/or logs also poses a risk of removing some of this duff layer as they move over the site. In order to mitigate the potential of damaging snail habitat during harvest operations, should Alternative D be selected, Equipment Restriction Zones would be placed around areas of known or potential snail habitat within Cutting Units 1. The potential for loss of either snail habitat or some of the snails themselves is anticipated to be minor compared to the long-term potential to maintain a healthy population of snails within the project area by eliminating the threat of catastrophic wildfire. The field survey of May 18, 2005 also found a healthy population of snails in those areas out side of Cutting Unit 1. These populations would likely remain intact and would not be damaged by human action if Alternative D were selected.

BIG GAME

Affected Environment

Issue: There is concern that timber harvesting activities associated with this project could alter habitat and/or create disturbance that would adversely affect big game species that use the project area.

Overstocked mature stands provide thermal protection and security for elk and deer in winter, which can reduce energy expenditures and stress associated with cold temperatures, wind, and human-caused disturbance. Although thermal cover attributes may be less important for elk than has been thought (Cook et al. 1998), areas with densely stocked mature trees are also important for snow interception, which makes travel and foraging less stressful during periods when snow is deep. Dense stands that are well connected provide for animal movements across wintering areas during periods with deep snow, which improves their ability to find forage and shelter under varied environmental conditions. Thus, removing this "winter cover" important to wintering elk and deer through forest management activities can increase their energy expenditures and stress in winter. Reductions in cover could ultimately result in a reduction in winter range carrying capacity and subsequent increases in winter mortality within local elk and deer herds.

Timber harvest can increase elk vulnerability by changing the size, structure, juxtaposition and accessibility of areas that provide security during hunting season (Hillis et al. 1991). As visibility and human access increase within forested landscapes, elk have a greater probability of being observed and subsequently harvested by hunters. Hillis and others (1991) recommended that effective elk security should be composed of nonlinear blocks of mature forest cover (with at least 50% canopy closure) that are at least 250 acres in size and at least one half mile from any open road (Hillis et al. 1991). They also suggested that security cover is lacking if less than 30% of an area is composed of security cover and stated that maintaining connectivity among

security areas is important (Hillis et al. 1991). Relationships of security cover and vulnerability for deer are not well known. However, because mule deer are less social than elk, and are smaller, they tend to use smaller patches of cover more effectively. It is generally assumed that if the security cover needs of elk are met, then those of deer are also met. Further, when elk security is demonstrated to be substantially compromised, adverse effects to mule deer can also be expected (albeit to a lesser degree than for elk). As with elk, affects on deer populations are skewed towards the male segment of the population with regard to security.

The proposed harvest area provides habitat primarily for deer and elk. Due to the large ranges of elk and the seasonal shifts in habitat use in this area, the area described in the grizzly bear analysis was used for assessing cumulative effects. Although deer and elk winter in the Project Area, it is not considered a key winter range and does not winter large concentrations of big game. In the Analysis Area, deer and elk tend to winter in lower elevation riparian/riverine habitats in the Clark Fork river valley and major riparian areas such as the Willow and Rock creek drainages. Elk also winter just to the east of the Analysis Area primarily on private grazing/ranch lands. Elk security, as defined by Hillis et al. (1991) is limited in the area around the Project Area and readily available in the federal lands to the south and west within the Analysis Area. Private lands with high road densities and low vegetative cover, which provides limited security habitat, dominate the area immediately adjacent to the Project Area. The area to the south of the Project Area within the Analysis Area is dominated by federal lands with low road densities and high cover values which provides high quality security cover. Radio telemetry data suggests that the Project Area functions as a movement corridor for elk moving from low elevation areas to roadless areas around Grouse Gulch (Canfield 1991). Canfield (1991) found that security habitats during the hunting season were "almost exclusively" within the Silver King roadless area. Big game security habitat in the Moyie-Grouse elk management unit was estimated at 34% (Canfield 1991) and would be reduced to approximately 31% if all security habitat in Section 36 were eliminated (draft Tyler Creek EA, 1998). This level of security is above the threshold suggested by Hillis et al. (1991), meaning that if all security habitat were eliminated in the Project Area it would still be above that minimum threshold suggested to "hold" elk and assure acceptable bull elk survival.

Effects of No-Action Alternative

If the No-Action Alternative were selected, no new roads would be built and cover would not be reduced in the Project Area, thereby resulting in no effect to big game winter cover and security. However, continued competition in the stand could ultimately result in stand replacing fire events that would reduce cover and increase vulnerability.

From a cumulative effects standpoint, winter cover and elk security in the area immediately adjacent to the Project Area is limited due to intensive harvesting on private commercial forestlands and the presence of development associated with the I90 corridor. However, security cover is readily available to the south and west of the Project Area within the Analysis Area and would not be affected by the proposed Action. These areas are on Federal lands and at low risk to manipulation in the near future. Therefore, selection of the No-Action Alternative would have no direct cumulative effect on these conditions, but would be beneficial to resident elk and deer due to limited levels of security and escape cover in the area around the Project Area, which is important as a movement corridor for elk. Increased risk of fire disturbance as a result of tree competition within the Project Area could result in minor potential negative indirect cumulative effects in the longer term by removing security and winter cover.

Effects of Alternative D

If Alternative D were implemented, 2.77 miles of road would be constructed and cover would be reduced in the Project Area, thereby resulting in reductions in big game winter and security cover. Although the current stand conditions in the Project Area provide high quality winter cover, riparian areas important to deer during severe winter conditions are generally not available within the Project Area and would not be affected by the proposed action. Although the Project Area generally functions as a movement corridor for elk moving from low elevation areas to roadless areas around Grouse Gulch (Canfield 1991), it is likely that some level of elk wintering occurs in the lower elevation portions of the Project Area. Consequently there would be minor negative effects of the proposed treatment on winter habitat conditions. These effects would be reduced somewhat by the retention of approximately 249 acre no-harvest corridor within the Project Area which would retain quality winter cover post harvest. In addition, 50 ft no-cut buffers would be retained around all springs within the Project Area, retaining some winter cover post harvest. Opening of the forest canopy would likely increase forage production within the Project Area, however this effect is likely of less incremental value due to the close proximity of quality forage areas on private lands within the Clark Fork river drainage just outside the Project Area to the north.

The proposed road construction would result in long term increases in road density, which would reduce elk security cover and increase big game vulnerability to hunter harvest. This effect is mitigated somewhat by the fact that the entire road system is closed at the entrance to the system by two separate closure devices which should result in minimal increases in hunter access.

Weed invasion is a concern in relation to big game forage production. Although this area is not considered critical winter range, and high quality winter forage is available just outside the Project Area to the north in the Clark Fork river drainage, weeds could be spread by the increased access created by the proposed action, thereby reducing any potential forage response post harvest. This effect is mitigated by spraying all roads remaining passable post harvest for weeds, requiring all equipment to be power washed before being brought to the Project Area. In addition, this effect is somewhat reduced by the fact that noxious weeds already occur within the Project Area and would affect big game forage even in the absence of the proposed treatment.

Treatment as proposed under Alternative D would result in reductions in tree competition within stands in the Project Area, which would likely reduce the potential for stand replacing fire events in the future. Therefore, there would be some minor potential beneficial effects as a result of treatment of these stands in the maintenance of winter cover and escape or security cover.

From a cumulative effects standpoint, winter cover and elk security within the area immediately around the Project Area within the Analysis Area is limited due to intensive harvesting on private commercial forestlands surrounding the Project Area. Implementation of Alternative D would reduce cover and increase road densities, thereby having some adverse cumulative effects. However, these effects are very minor due to the fact that this is a movement corridor for elk and not considered critical wintering habitat for big game. In addition, the high level of security from hunter harvest available within the Analysis Area on Federal lands to the south and west of the Project Area will not be affected by the proposed action and are at low risk of manipulation in the near future.

Cumulative Effects Associated with Other DNRC Projects-

Other DNRC projects are either ongoing or have been recently completed in the general area around the Tyler Creek Project Area. The following Table displays the name of the proposed activity, the year when activity is planned, and the type of activity proposed. Phoenix is a mixed harvest (stand replacing, mosaic, and post-rail) accepted for harvest in 2004. This harvest is located approximately 12 miles to the south and included effects on elk security cover. However, the analysis unit identified in the Phoenix EIS is outside of the Grouse-Moyie elk analysis area used to assess security cover in the Tyler Creek analysis and so there were no effects from this harvest on this elk security assessment. This harvest is within the grizzly bear, wolf, and lynx Analysis Area, however it is unlikely that activities associated with Phoenix would affect this assessment due to the spatial separation of these projects, the type of harvest proposed in the Phoenix project (large proportion of unit in low intensity post-rail treatment), and the minor incremental effect further treatment would have on wide ranging species in this area. The Dirty Ike salvage, located approximately 14 miles to the northwest, is just outside the Analysis Area for black backed woodpeckers. However, it occurred within the Ryan Gulch fire, which was discussed above relative to effects on black-backed woodpecker habitat. Although the fire event likely had some positive affect on black-backed woodpecker populations in this area, the Dirty Ike harvest has been completed and would not likely affect this assessment. The detectable effect on black-backed woodpeckers is likely very minor when considered with the low amount of habitat in the fire area (due to intensive forest management pre-fire) and the extensive salvage treatments on private lands more spatially associated with the Tyler creek area.

Project Name	Air miles from Tyler Creek	Year of Proposed Activity	Description of proposed activity
Dirty Ike Salvage	14	2004	Fire salvage
Phoenix	12	2005	Mixed (stand replacing to post and rail)

Wildlife Related Mitigation Measures-

1. If any threatened or endangered species were encountered during the project planning or implementation periods, all project-related activities that would potentially affect that species would cease and a DNRC wildlife biologist would be informed immediately. Additional habitat protection measures would be designed and implemented as appropriate.

2. If active den sites or nest sites of threatened, endangered, sensitive species, or other raptors were located within the Project Are, activities would cease until a DNRC biologist could review the site and develop species appropriate protective measures.

3. Public access within the Project Area would be managed to minimize disturbance to important wildlife, minimize incidental affects to important habitat features such as snags and downed woody debris, to reduce potential mortality effects on threatened, endangered, and sensitive species, and to manage big game harvest vulnerability.

SOILS AND HYDROLOGY-

A DNRC Hydrologist analyzed the effects of the proposed Alternative D and he found that the anticipated effects of the modified proposed action are within the range of effects analyzed for under both of the previous Action Alternatives B and C that were contained in the original EA. As a result of this analysis, it was concluded that there is little risk of adverse impacts to water quality, cold-water fisheries and other beneficial uses occurring as a result of Alternative D. This conclusion applies to the potential risk of direct, indirect and cumulative adverse effects to water resources and beneficial uses of those water resources, including cold-water fisheries. In fact, the original assessment that erosion control measures aimed at stabilization of existing stream crossings and other improvements to the existing road system are expected to result in a long-term improvement to downstream water quality and improved protection of beneficial uses still holds true under the proposed Alternative D.

In regards to cumulative watershed effects, both the existing water yield increases (WYI) and anticipated WYI resulting from Alternative D are very similar to those analyzed for in the original EA. In most cases the existing WYI and proposed WYI are actually lower than originally analyzed for due to the amount of additional vegetative recovery that has occurred in the existing harvest units since the original analysis was conducted in 1999. Results of the updated water yield analysis indicate that the levels of WYI anticipated under the modified proposed action are still below those levels normally associated with detrimental impacts to stream channel stability and function.

OLD GROWTH-

DNRC has adopted Green et al (1992) to define old growth on State lands. This definition is based on the number, age, and size of trees over a specified dbh per acre based on habitat type and cover type. DNRC's Stand Level Inventory (SLI) provides the initial data for labeling stands as old growth at the project level, stands identified as old growth through the SLI are verified through field reconnaissance and/or the collection of field data from the project stands.

Table 1 displays the current amount and distribution of old growth (i.e. those stands that meet the minimum criteria in Green et al 1992) within the cutting units proposed in Alternative D. The table also illustrates the condition of these stands following the proposed harvest activities. **Exhibit #10** displays the locations of those stands that meet DNRC's old growth criteria within section 36.

Table 1-Projected Impacts of Alternative D Upon Current Conditions and Old Growth Stands in the Proposed Tyler Creek Timber Sale.

Tyler Creek Timber Sale Old Growth Forest Conditions							
		Current			Post-Harvest, Alternative D		
Cutting Unit	Acres	Live Trees/Acre >21" dbh prior to harvest	Dead Trees/Acre >21" dbh prior to harvest	Is Green et al (1992) Criteria* met?	Live Trees/Acre >21" dbh post-harvest	Dead Trees/Acre >21" dbh post-harvest	Is Green et al (1992) Criteria met?
1	30	5	4	NO	4	1	NO
2	17	2	8	NO	1	0	NO
3	69	10	3	YES	8	2	YES
4	16	5	0	NO	5	0	NO
5	37	8	6	YES	6	4	YES
6	110	8	4	YES	5	2	NO
7	20	6	3	NO	4	1	NO
8	60	3	4	NO	3	1	NO
MEAN		6	4		5	2	

*8 large trees/acre 21" dbh or more. Large trees 170 years old or more.

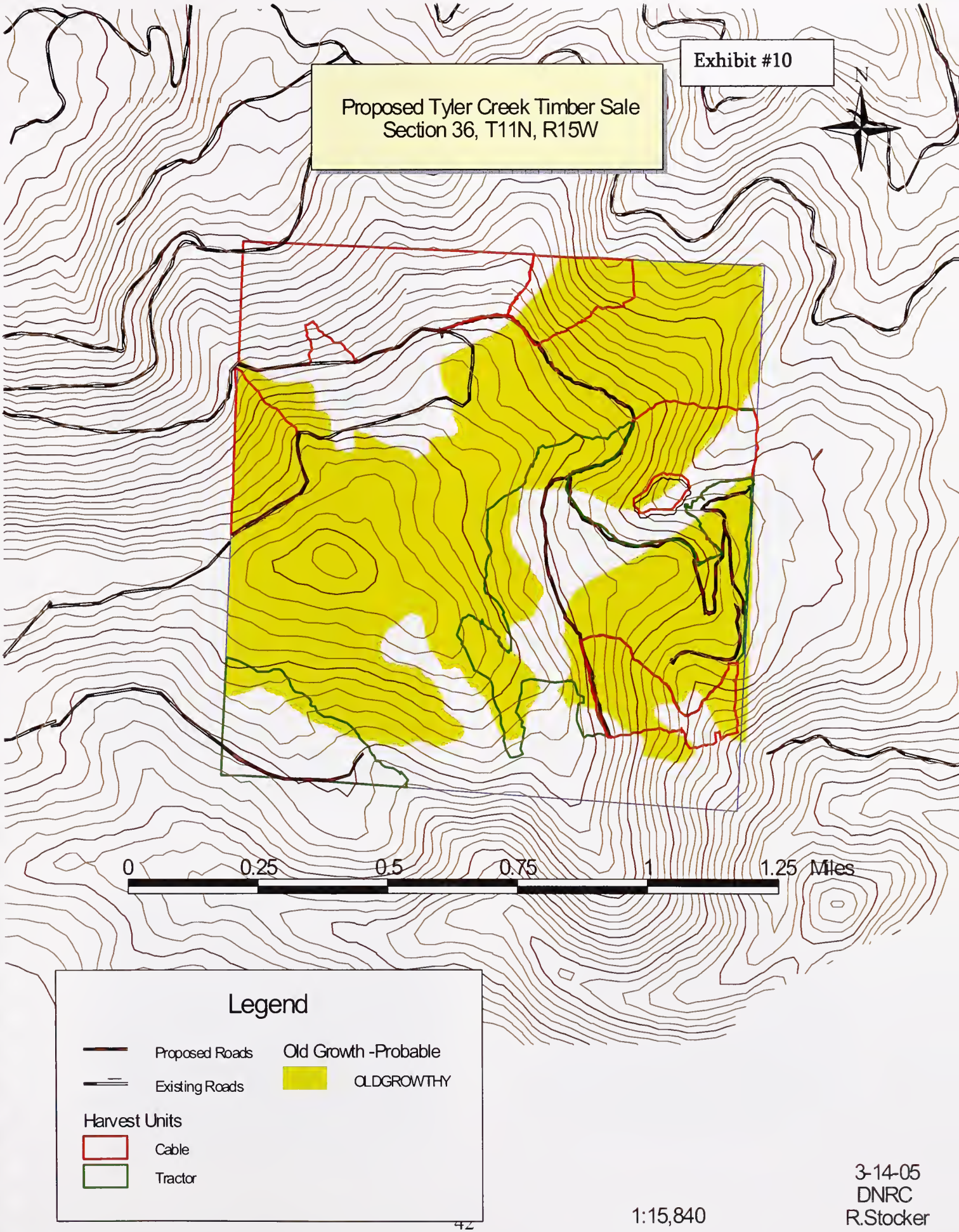


Exhibit #10
Proposed Tyler Creek Timber Sale
Section 36, T11N, R15W
N
0
0.25
0.5
0.75
1
1.25 Miles
Legend
Proposed Roads
Existing Roads
Old Growth -Probable
OLDGROWTHY
Harvest Units
Cable
Tractor
1:15,840
3-14-05
DNRC
R.Stocker

Analysis indicates that 216 acres (60%) of the 359 acres of proposed cutting units meet the minimum criteria to be considered old growth under Green et al (1992). If Alternative D were to be implemented as proposed, 110 (51%) acres would no longer meet the Green et al (1992) minimum standards for old growth.

In addition to the 216 acres of old growth forest contained within the harvest units proposed in Alternative D, SLI data and filed reconnaissance indicate that the vast majority (90-95%) of the 249 acre no-harvest corridor also meets Green et al (1992) criteria. Therefore, the combined total acres of old growth that currently exist within the proposed project area is estimated to be between 440 and 453 acres.

EFFECTS OF NO ACTION ALTERNATIVE-

Under the No Action Alternative, none of the forested acres which currently meet the minimums set forth in Green et al (1992) for consideration as old growth would be treated. However, given the epidemic population of Douglas fir beetle within the proposed sale area, it is likely that the continued mortality of the larger Douglas fir trees may cause these affected stands to fall below the minimum Green et al (1992) criteria for old growth. At the present time, plot data indicates that 41% of the trees over 21" dbh within the proposed harvest units are dead. While some of these trees may have succumbed to other causes, the Douglas fir beetle has killed the vast majority. Schmitz and Gibson (1996) indicate that Douglas-fir beetle outbreaks usually coincide with periods of drought and can last from 2-4 years. As there does not appear to be an end to the drought predicted for 2005, it is highly likely that the current infestation will continue unabated into 2006 at least. As a result, the continued mortality of the larger Douglas-fir trees within Section 36 may reach the point that, even in unharvested areas, there are less than 8 live trees greater than 21" dbh per acre.

In addition to the threat posed to the large, live trees within the proposed sale area by the beetle infestation, 100 years of fire suppression have created a fuels and stand structure condition which makes these trees much more susceptible to mortality from fire. Historically, stands within the proposed project area would have been subjected to frequent (25-50 year interval) non-lethal ground fires. This fire regime would have promoted an uneven-aged, relatively open stand dominated by shade intolerant species such as ponderosa pine and western larch. Given that approximately 1/3 to ½ of Section 36 is a northerly aspect, historic stands would have had a higher component of Douglas fir than those on more southerly and westerly aspects. This has been borne out by the predominance of large Douglas fir trees on the northerly aspects and large ponderosa pine on the southerly aspects in the stands that currently exist.

Organized fire suppression has, within the last 100 years, largely removed the periodic disturbance mechanism of low intensity ground fire from the stands within the proposed sale area. Historically, these fires would have maintained an open spacing, Green et al (1992) indicate that those stand types within the proposed project area would have been single-storied with 17-18 trees over 21" per acre. Plot data gathered in February and March show that the stands within the proposed project area average 188 trees per acre 5" dbh and larger. In addition, there are areas within the project area that are overstocked with Douglas-fir regeneration, which would not have become established under historic fire regimes. These areas of dense Douglas-fir regeneration present a threat to the large, old trees in the project area in that, in the event of a wildfire, they would become "ladder fuel". These "ladder fuels" would allow a ground fire to climb into the crowns of the large trees thereby increasing

the risk of mortality due to bole and/or crown scorch (**Exhibits #11-13**). Fuels conditions such as these were likely to be extremely rare given the historic regime of low-intensity ground fires every 25-50 years.

Exhibit #11-Douglas fir trees creating a ladder fuel condition under 2 large ponderosa pines.

Exhibit #12-Douglas fir ladder fuels around a large broken-top ponderosa pine.

Exhibit #13-Douglas fir ladder fuels under a younger (80-90 years) ponderosa pine.

Therefore, while selection of the No Action Alternative would not conduct any harvesting of timber within old growth stands, it is quite likely that either the current beetle epidemic, or the fuel conditions present within section 36 will preclude the long-term survival of these stands. Even if the beetle epidemic were to end immediately, and a wildfire did not occur within the proposed project area, the continued development of overstocked stands of shade-tolerant trees, especially Douglas-fir will provide a level of inter-tree competition for light, water and nutrients that the large, old trees likely cannot withstand.

EFFECTS OF ALTERNATIVE D-

If Alternative D were to be implemented, 110 acres (Harvest Unit #6) would no longer meet Green et al (1992) criteria for consideration as old growth following harvest. The number of live trees/acre ≥21" dbh would be reduced from 8 to 5. The remaining area within section 36 which currently meet the Green et al (1992) criteria would not fall below that criterion as a result of harvesting operations.

Harvest unit #6 would be treated in this manner for the following reasons-

- The largest areas of existing Douglas-fir mortality, and recent beetle activity occur within unit #6.
- The most contiguous groups of Douglas-fir trees 16" dbh and over, within the proposed harvest units occur within unit #6.
- Given the above factors, it appears that those trees most likely to be attacked, and subsequently killed, by the

Douglas-fir beetle are located in unit #6.

- In order to meet the project objective of harvesting those large, high-value Douglas-fir trees, which are likely to succumb to the Douglas-fir beetle, it was decided to harvest these trees while they are still alive.

In the remainder of the proposed harvest units, stand conditions following timber harvesting would still retain the minimum number of trees ≥21" dbh required under ARFM. In addition, those large trees that would remain following harvest would have a significant number of the smaller, shade-tolerant trees which are providing both inter-tree competition and in some cases ladder fuel removed. By removing these smaller trees, the following should occur-

- The reduced inter-tree competition may increase or at least maintain the vigor of the remaining large Douglas-fir trees, giving them an improved chance of surviving an attack by Douglas-fir beetles.

- In the case of the remaining large, old ponderosa pine and larch trees, the reduced inter-tree competition would likely improve their health and vigor, thereby lengthening their life span.

- Removing ladder fuels adjacent to those large, old trees that would be retained following harvest, would dramatically reduce the likelihood of their loss due to either basal or crown scorch in the event of a wildfire. In addition, the removal of these ladder fuels would likely reduce the likelihood of a crown fire occurring within section 36, thereby reducing the size and intensity of any wildfire that might start within the proposed project area.

While implementation of Alternative D would appear to have a negative short and long-term effect upon old growth stands within the project area, given the high likelihood that the beetle epidemic will continue unabated for another 1-2 years, it appears highly doubtful that proposed harvest unit #6 would meet Green et al (1992) criteria even if it were left unharvested.

CUMULATIVE EFFECTS TO OLD GROWTH-

NO ACTION ALTERNATIVE-

Implementation of the No Action Alternative would preclude timber harvesting in any of the stands that currently meet Green et al (1992) criteria. However, given the likelihood that the Douglas-fir beetle will continue unabated for at least another year, leaving these stands untreated does not guarantee that they will continue to provide those attributes most commonly associated with old growth stands.

In addition, without the reduction of the inter-tree competition and ladder fuels that are currently being created by the large numbers of smaller shade-tolerant trees that have become established as a result of fire suppression the likelihood of the continued survival of the large, old trees that are present in section 36 is being markedly reduced. The entirety of section 36 is located in a hot, dry climate zone in which the limited water and nutrients are not able to support the current stocking level within these stands. As a result of their advanced age and resultant loss of vigor, the large, old trees that are present are not able to compete, and therefore succumb.

Field reconnaissance and fire occurrence records show that section 36 is in an area of frequent lightning fires, and occasionally large fires-the Ryan Gulch Fire approximately 5 air miles to the north burned 17,000 acres in 2000. Given the high frequency of fire starts in this area, it would appear to be only a matter of time before a portion or all of the old growth stands within section 36 are lost to wildfire if the ladder fuel situation is not mitigated. This is most likely in a stand of extremely large ≥28" ponderosa pine that are in proposed harvest unit #1. These trees are growing on a southerly aspect and are undergrown by significant amounts of small (3-8" dbh) Douglas fir, which present a substantial ladder fuel threat.

As a result of these aforementioned factors, implementation of the No Action Alternative would have negative short and long term cumulative effects upon the old growth stands that currently exist within the proposed project area. By not addressing the increasing threats to these stands posed by both inter-tree competition and increasing fuel loads, the No Action Alternative would only hasten the demise of these stands.

ALTERNATIVE D-

While implementation of Alternative D would have the short-term effect of reducing the acreage of old growth stands within the project area, it would also implement those strategies, which would improve the likelihood of the remaining stands surviving for the foreseeable future. By reducing the number of smaller trees and thereby reducing the inter-tree competition and removing ladder fuels from these stands, the probability that they would retain their old growth characteristics in the future is greatly improved. Implementing Alternative D would also provide whatever limited improvement, through reduced inter-tree competition and the resultant increased vigor, of the chances that any of the large, old Douglas-fir may have to ward off an attack by the Douglas-fir beetle. Therefore, while implementation of Alternative D would have a short-term negative cumulative effect on old growth, it would have a long-term positive effect on this resource.

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